

NOTES ON STONEHENGE.<sup>1</sup>

## VII.—ON THE DARTMOOR AVENUES.

SOME years ago I referred in NATURE to the numerous alignments of stones in Brittany, and I was allowed by Lieut. Devoir, of the French Navy, to give some of his theodolite observations of the directions along which the stones had been set up.

The conclusion was that we were really dealing with monuments connected with the worship of the sun of the May year, a year which the recent evidence has shown to have been the first recognised after the length of the year had been determined; thus replacing the lunar unit of time which was in vogue previously, and the use of which is brought home to us by the reputed ages of Methuselah and other biblical personages, who knew no other measurer of time than the moon.

There was also evidence to the effect that in later times solstitial alignments had been added, so that the idea that we were dealing with astronomically oriented rows of stones was greatly strengthened, not to say established.

So long as the Brittany alignments were things of mystery, their origin, as well as that of the more or less similar monuments in Britain, was variously explained; they were models in stone of armies in battle array, or they represented funeral processions, to mention only two suggestions. I should add that Mr. H. Worth, who has devoted much time to their study, considers that some sepulchral interest attaches to them, though he thinks it may be argued that that was secondary, even as are interments in cathedrals and churches. About burials associated with them, of course, there is no question, for the kistvaens and cairns are there; but my observations suggest that they were added long after the avenues were built, as some cairns *block* avenues. Perhaps a careful study of the mode of burial may throw light on this point.

The equivalents of the Brittany alignments are not common in Britain; they exist in the greatest number on Dartmoor, whither I went recently to study them. The conditions on high Dartmoor are peculiar.

Blinding mists are common, and, moreover, sometimes come on almost without warning. From its conformation the land is full of streams. There are stones everywhere. What I found, therefore, as had others before me, was that as a consequence of the conditions to which I have referred, directions had been indicated by rows of stones for quite other than ceremonial purposes. Here, then, was a possible third origin. It was a matter of great importance to discriminate most carefully between these alignments, and to endeavour to sort them out. My special inquiry, of course, was to see if they, like their apparent equivalents in Brittany, could have had an astronomical origin. The first thing to do, then, was to see which might have been erected for worship or which for practical purposes.

In doing this there is no difficulty in dealing with extremes. Thus one notable line of large flat stones has been claimed by Messrs. R. N. Worth and

R. Burnard as a portion of the Great Fosseway (Rowe's "Perambulation," third edition, p. 63); it has been traced for eighteen miles from beyond Hameldon nearly to Tavistock, the stones being about 2 feet thick and the road 10 feet wide.

There are two notable avenues of upright stones at Merrivale; they are in close connection with a circle, and could have had no practical use. These stones, then, we may claim as representing the opposite extreme of the Fosseway and as suggesting an astronomical, as opposed to a practical, use; the adjacent circle, of course, greatly strengthens this view.

It is between these extremes that difficulties may arise, but the verdict can, in a great many cases at all events, be settled without any very great hesitation, especially where practical or astronomical uselessness can be established. But even here care is necessary, as I shall show.

The stones now in question, originally upright, are variously called avenues, rows, alignments or

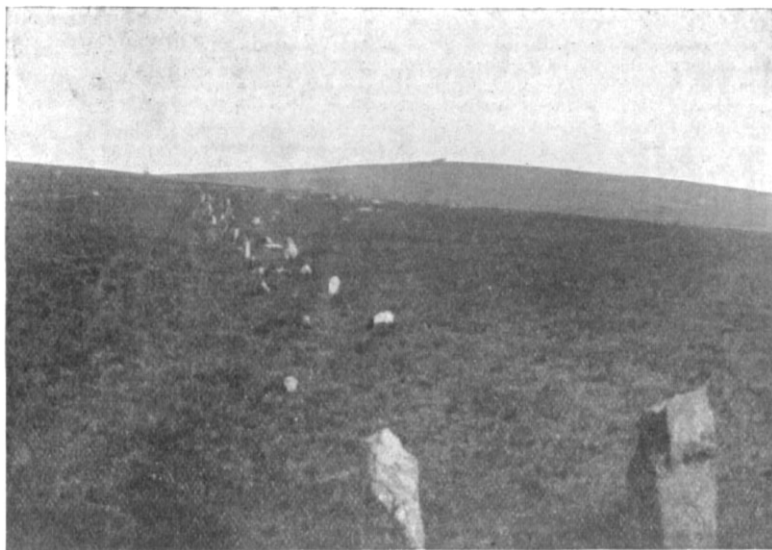


Photo. by Lady Lockyer.

FIG. 17.—The Southern Avenue at Merrivale, looking East.

parallelithons. Their study dates from 1827, when Rowe and Colonel Hamilton Smith examined those at Merrivale (Rowe, *op. cit.*, p. 31). Their number has increased with every careful study of any part of the moor, and doubtless many are still unmapped.<sup>1</sup> The late Mr. R. N. Worth, of Plymouth, and his son, Mr. H. Worth, have given great attention to these monuments, and the former communicated a paper on them to the Devonshire Association for the Advancement of Science in 1892 (Trans., xxv. pp. 387-417).

A word of caution must be said before I proceed. We must not take for granted that the stone-rows are now as they left the hands of the builders. The disastrous carelessness of the Government in the matter of our national antiquities is, I am locally informed, admirably imitated by the Devonshire County and other lesser councils, and, indeed, by anybody who has a road to mend or a wall to build. On this account, any of the rows may once have been much longer and with an obvious practical use; and

<sup>1</sup> Only yesterday (June 15) that excellent guide of the Chagford part of the moor, Mr. S. Perrott, showed me an avenue (Azimuth N. 20° E. true) near Hurston Ridge which is not shown in the 1-inch map.

<sup>1</sup> Continued from p. 34.

those which now appear to be far removed from circles may once have been used for sacred processions at shrines which have disappeared.

Again, the rows of stones we are now considering must not be confounded with the "track lines" or "boundary banks" which are so numerous on Dartmoor and are represented in Wiltshire according to Sir R. C. Hoare; these serve for bounds and pathways, and for connecting and enclosing fields or houses.

Dealing, then, with stone rows or avenues, which may be single, double, or multiple; any which are very long and crooked, following several directions, are certainly not astronomical; and it is easy to see in some cases that they might have been useful guides at night or in mist in difficult country with streams to cross. This possible utility must not be judged wholly by the present conformation of the ground or the present beds of streams.

For multiple avenues it is hard to find practical uses such as the above, and we know how such avenues were used in Brittany for sun worship. Mr. Baring Gould considers there were eight rows in an avenue on Challacombe Down 528 feet long; of these only three rows remain, the others being represented by single stones here and there (Rowe, p. 33). I shall have something to say about this avenue further on.

Although, as I have said, long rows bending in various directions are not likely to have had an astronomical origin, it must not be assumed that all astronomical avenues must be *exactly* straight. This, of course, would be true for level ground, but if the avenue has to pass over ridges and furrows, the varying height of the horizon must be reckoned with, and therefore the azimuth of the avenue at any point along it.

I think it possible that in the Staldon Moor row we have the mixture of religious and practical intention at which I have before hinted. Both Mr. Lukis and Mr. Hansford Worth have studied this monument, which is two miles and a quarter long. There is a circle at the south end about 60 feet in diameter, while at its northern end there is a cairn.

Where the line starts from the circle the direction of the row is parallel to many sight-lines in Cornwall, and Arcturus would rise in the azimuth indicated. But this direction is afterwards given up for one which leads towards an important collection of hut circles, and it crosses the Erme, no doubt at the most convenient spot. More to the north it crosses another stream and the bog of Red Lake. All this is surely practical enough, although the way indicated might have been followed by the priests of the hut circles to the stone circle to prepare the morning sacrifice and go through the ritual.

But there is still another method of discrimination. If any of these avenues were used at all for purposes of worship, their azimuths should agree with those already found in connection with circles in other parts of Britain, for we need not postulate a special race with a special cult limited to Dartmoor; and in my inquiries what I have to do is to consider the general question of orientation wherever traces of it can be found. The more the evidences coincide the better it is for the argument, while variations afford valuable tests.

Now, speaking very generally (I have not yet compared all my numerous notes), in Cornwall the chief alignments from the circles there are with azimuths N.  $10^{\circ}$ – $20^{\circ}$  E. watching the rise of Arcturus, N.  $24^{\circ}$ – $28^{\circ}$  E. watching the rise of the May sun, N.  $75^{\circ}$ – $82^{\circ}$  E. watching the rise of the Pleiades. The

variation in the azimuths is largely due to the different heights of the horizon towards which the sight-lines are directed.

The conclusion I have come to is that these alignments, depending upon circles and menhirs in Cornwall, are all well represented on Dartmoor associated with the avenues; and further, so far as I have learned at present, in the case of the avenues connected with circles, there are not many alignments I have not met with in connection with circles in Cornwall and elsewhere.

This is not only a *prima facie* argument in favour of the astronomical use underlying the structures, but it is against the burial theory, for certainly there must have been burials in Cornwall.

In order, therefore, to proceed with the utmost caution, I limit myself in the first instance to the above azimuths, and will begin by applying a test which should be a rigid one.

If the avenues on Dartmoor had to deal with the same practices and cults as did the circles in Cornwall, they ought to prove themselves to have been in use at *about* the same time, and from this point of view the investigation of the avenues becomes of very great importance, because of the destruction of circles and menhirs which has been going on, and is still going on, on Dartmoor. We have circles without menhirs and menhirs without circles, so that the azimuths of the avenues alone remain to give us any chance of dating the monuments if they were used in connection with sun worship. The case is far different in Cornwall, where both circles and menhirs have in many cases been spared.

On Dartmoor, where in some cases the menhirs still remain, they have been annexed as crosses or perhaps as boundary stones, and squared and initialed; hence the Ordnance surveyors have been misled, and they are not shown as ancient stones on the map. In some cases the azimuth of the stones suggests that this has been the sequence of events.

It will be seen from the above that I have not tackled a question full of pitfalls without due caution, and this care was all the more necessary as the avenues have for long been the meeting ground of the friends and foes of what Rowe calls "Druidical speculations"; even yet the war rages, and my writing and Lieut. Devour's observing touching the similar but grander avenues of Brittany have so far been all in vain; chiefly, I think, because no discrimination has been considered possible between different uses of avenues, and because the statements made by archaeologists as to their direction have been quite useless to anybody in consequence of their vagueness, and last of all because the recent work on the Brittany remains is little known.

I began my acquaintance with the Dartmoor monuments by visiting Merrivale, and the result of my inquiries there left absolutely no doubt whatever on my mind. I was armed, thanks to the kindness of Colonel Johnston, the director of the Ordnance Survey, with the 25-inch map, while Mr. Hansford Worth had been so good as to send me one showing his special survey.

The Merrivale avenues (lat.  $50^{\circ} 33' 15''$ ) are composed of two double rows, roughly with the azimuth N.  $82^{\circ}$  E.; the northern row is shorter than the other. Rowe, in his original description (1830), makes the northern 1143 feet long; they are not quite parallel, and the southern row has a distinct "kink" or change of direction in it at about the centre. The stones are mostly 2 or 3 feet high, and in each row they are about 3 feet apart; the distance between the rows is about 80 feet.

I have before pointed out that an avenue directed to the rising place of a star, if it is erected over undulating ground, cannot be straight. I may now mention another apparent paradox. If two avenues are directed to the rising place of the same star at different times, they cannot be parallel. It is not a little curious that absence of parallelism has been used against avenues having had an astronomical use!

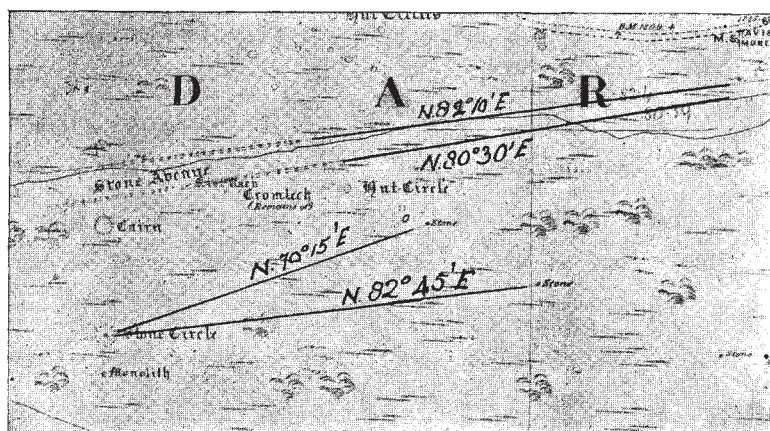


FIG. 18.—Plan, from the Ordnance Map, showing the avenues, circle and stones at Merrivale, with their azimuths.

Both the Ordnance surveyors and Mr. Worth have shown the want of parallelism of the two avenues, and Mr. Worth has noted the kink in the southern one. The height of the horizon, as determined from my measures, is  $3^{\circ} 18'$ . The results of these inquiries, assuming the Pleiades to have been observed warning May morning, are as follows:—

Azimuth	Authority	N. Declination	Date B.C.
N. $83^{\circ} 15'$ E.	Worth	$6^{\circ} 47' 47''$	1710
82° 30'	Worth	$7^{\circ} 16' 20''$	1630
82° 10'	Ordnance	$7^{\circ} 32' 0''$	1580
80° 40'	Worth	$8^{\circ} 26' 0''$	1420
80° 30'	Ordnance	$8^{\circ} 30' 0''$	1400

To simplify matters we may deal with the Ordnance values and neglect the small change of direction in the southern avenue. We have, then, the two dates 1580 B.C. and 1420 B.C. for the two avenues. The argument for the Pleiades is strengthened by the fact that at Athens the Hecatompelon was oriented to these stars in 1495 B.C. according to Mr. Penrose's determination of the azimuth.

Now this is not the first time I have referred to avenues in these notes. The azimuth of one at Stonehenge was used to fix the date at which sun worship went on there. That avenue, unlike the Dartmoor ones, was built of earth, and it is not alone. There is another nearly two miles long called the Cursus. So far, I have found no solstitial worship on Dartmoor, so there are no avenues parallel to the one at Stonehenge leading N.E. from the temple. But how about the other? *It is roughly parallel to the avenues at Merrivale, and I think, therefore, was, like*

*them, used as a processional road, a via sacra, to watch the rising of the Pleiades.*

I said roughly parallel; its azimuth is about the same (N.  $82^{\circ}$  E. roughly); but the horizon is only about  $1^{\circ}$  high; it was therefore in use before those at Merrivale; the exact date of use must wait for theodolite values of the height of the horizon, but in the meantime we can see from the above estimates that the declination of the Pleiades was about N.  $5^{\circ} 28' 30''$  and the date of use 1950 B.C., that is, some 300 years before the solstitial restoration.

Mr. Worth's survey gives another line of stones which is not shown in the Ordnance survey. It is undoubtedly, I think, an ancient line, although it is not shown in the Ordnance map, a clear indication of the difficulty of discriminating these avenues on land cumbered with stones in all directions. Its azimuth is N.  $24^{\circ} 25'$  E., and the height of the horizon  $5^{\circ} 10'$ . This gives us Arcturus at the date 1860 B.C., showing that, as at the Hurlers, Arcturus was used before the Pleiades. Hence a possible astronomical use is evident, while this row, like the others, could have been of no practical use to anybody. It is interesting to note that this single row of stones is older than the double ones; this seems natural.

It is worth while to say a word as to the different treatment of the ends of the south avenue now that it seems probable that it was used to watch the rising of the Pleiades. At the east end there is what archæologists term a "blocking stone"; these observations suggest that it was really a sighting stone. At the west end such a stone is absent, but the final

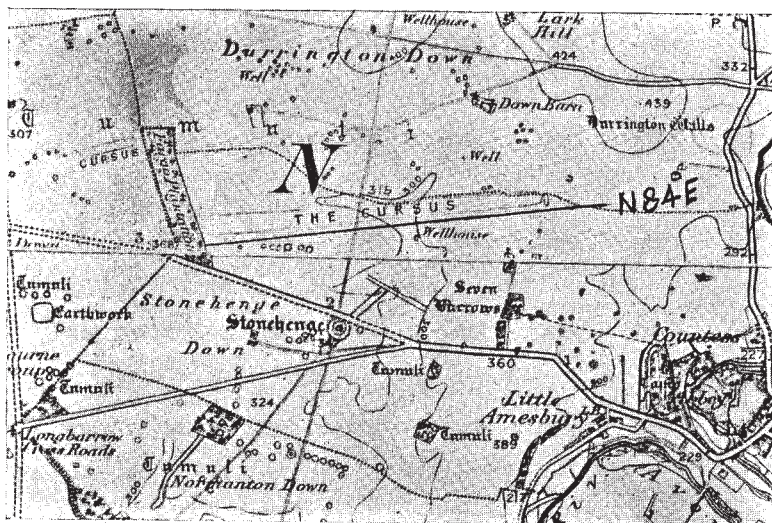


FIG. 19.—Reprint of Ordnance Map showing that the Cursus at Stonehenge is nearly parallel to the Merrivale Avenue. The azimuth is  $82^{\circ}$  and not  $84^{\circ}$  as shown in the figure.

stones in the avenue are longer than the rest. This may help us to determine the true direction of the sight-lines in other avenues, and, indeed, I shall show in the sequel that it affords a criterion which in some cases is entirely in harmony with other considerations.

NORMAN LOCKYER.